

# Evaluation of Phosphorus and Potassium Rates on Soybean as a Tool to increase Yield and Protein

**Cooperator:** Ron Peterson

**Nearest town:** Crookston

**Variety:** Legend 0082

**Planted:** June 15, 2004

**Harvested:** Oct. 12, 2004

**Soil test:**

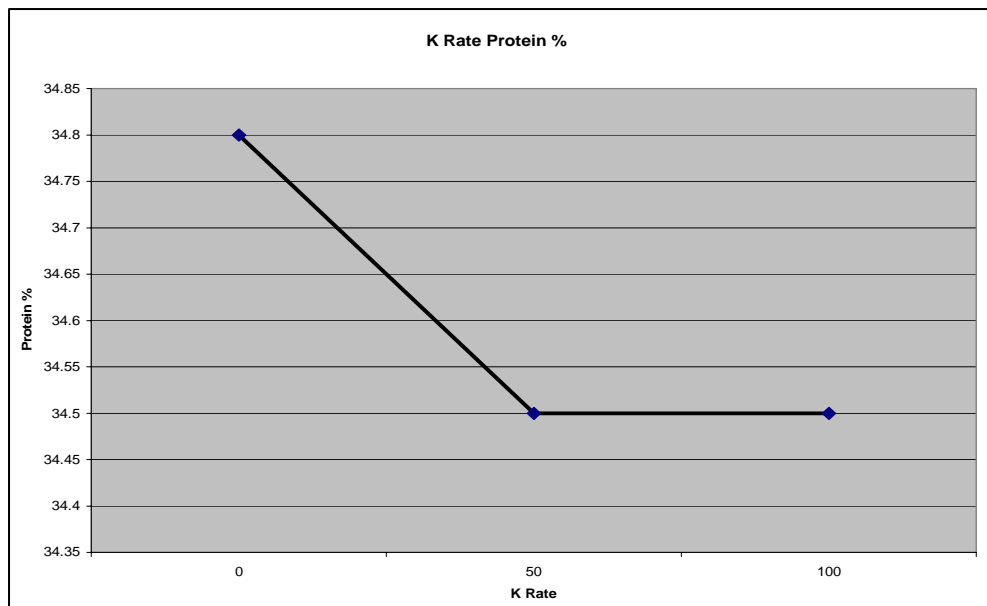
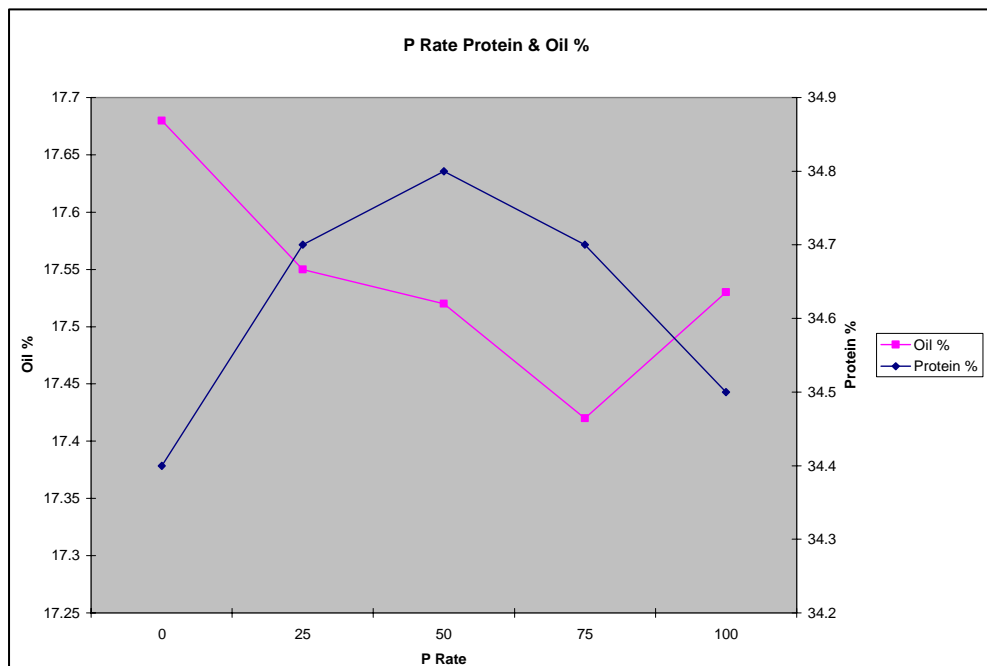
Olsen P	3ppm
Potassium	60ppm
Organic matter	4.7%
pH	8.3

## Results:

One of the sites had to be abandoned in 2004 due to poor stands and excessive frost damage in August. At the site harvested, there was a significant increase in protein up to the 50 pound per acre rate of  $P_2O_5$  and a significant decrease in oil percent up to the 75 pound rate of  $P_2O_5$  rate per acre as can be seen in Graph 1. Whether these small differences are economic is another question. The addition of potassium fertilizer significantly decreased protein by 0.3 % with the 25 and 50 pound rates per acre as noted in Graph 2. There were no significant differences for soybean grain yield. The abnormal growing conditions and August frost make interpretations from this data challenging.

## Purpose of study:

New soybean cultivars with higher yield potentials have been developed for the region over the past ten years and this prompted the idea to conduct a phosphorus and potassium rate study to determine if the phosphorus and potassium nutritional needs of the crop were still being met from residual phosphorus and potassium in the soil. Previous research showed significant increases in yield and protein with the addition of phosphorus fertilizer and to a lesser extent potassium fertilizer on lower testing soils. In 2004, soybean phosphorus and potassium rate experiments were conducted at two locations in Northwestern Minnesota on soils testing low to medium for  $P_2O_5$  and  $K_2O$ .



## Funding:

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## For additional information:

Russ Severson      George Rehm  
Albert Sims